CS5260 final project requirements and grading criteria

Topic

The final project either describes or studies deep learning techniques. This includes (but is not limited to) all modules we learned in our weekly lecture (e.g. Adversarial Machine Learning in week 1 and ChatGPT in week 5). We suggest one simple way to check whether your project topic is okay. That is, you can search your project keyword in NeurIPs 2022 accepted paper and check whether you can find a related work there.

(NeurIPs 2022 accepted paper list: https://openreview.net/group?id=NeurIPS.cc/2022/Conference)

Examples of such projects may include: a work proposing a new learning algorithm; one that describes a solution to a difficult application; or one that proves bounds on the error of some learning method.

If you can not find any project ideas, the instructor can assign you some challenging implementation tasks (this is not required and should be based on your interests).

If you still have a concern about your project topic, you can contact TA or Instructor.

Evaluation

Whenever appropriate, the final projects will therefore be evaluated on the basis of the following five criteria:

1. **Novelty of algorithm.** For example, a work that gives an elegant new derivation for an algorithm; or one that proposes a new approach to an existing problem.
2. **Novelty of application/problem.** For example, a work that addresses an important application that has heretofore been little-studied before. Or, one that introduces a novel machine learning problem and proposes an algorithm for it.
3. **Difficulty of application.** For example, an application of machine learning to a difficult, important, and "real" application, that takes into account the full complexity of getting a non-trivial system to work.
4. **Quality of results.** Whether the algorithm is rigorously demonstrated to give good empirical performance on the task considered (here, "real" data or "real" experiments may be more effective than "artificial" or "toy" experiments); or whether the theoretical results are strong and interesting; etc.
5. **Insight conveyed.** Whether the work conveys insight into the nature of an algorithm; into the nature of a practical application or problem; into general lessons learned; and/or into theoretical or mathematical tools that might be used by others for future work.

Not all projects are expected to address all of these criteria above, and a work that is extremely strong on only one of them may also well be acceptable for this course. For example, a learning theory work that studies an existing algorithm may be reasonably expected to address only the last of these criteria.

(Optional & Encouraged). You are encouraged to upload your final project report to arxiv.org or submit it to a conference/journal. The instructor will give you a bonus if your publication quality is high enough to be published. You do **NOT need** to include the instructor or the TA as the co-author of your publication. But if you like, you can collaborate with the instructor or the TA in your project.

Example of the final project

https://arxiv.org/pdf/1404.5997.pdf
https://openreview.net/pdf?id=OM0jvwB8jIp57ZJjtNEZ

To inspire ideas, you might also look at recent deep learning publications from top-tier conferences like CVPR, ICML, ICLR, NeurIPS:

https://openreview.net/group?id=ICLR.cc/2021/Conference
https://papers.nips.cc/paper/2021

Deadline and Submission

Send it to yang.you.cs@gmail.com before 1st of May
Use NeurIPS format
    https://nips.cc/Conferences/2022/PaperInformation/StyleFiles
    The report should have at most 9 pages (contents & references)
    No appendix is allowed.